Dec. 15, 1942. F. H. LUECKE 2,305,541

SERVICE CONNECTOR AND DISTRIBUTOR UNIT

Filed Jan. 19, 1940 2 Sheets-Sheet 1

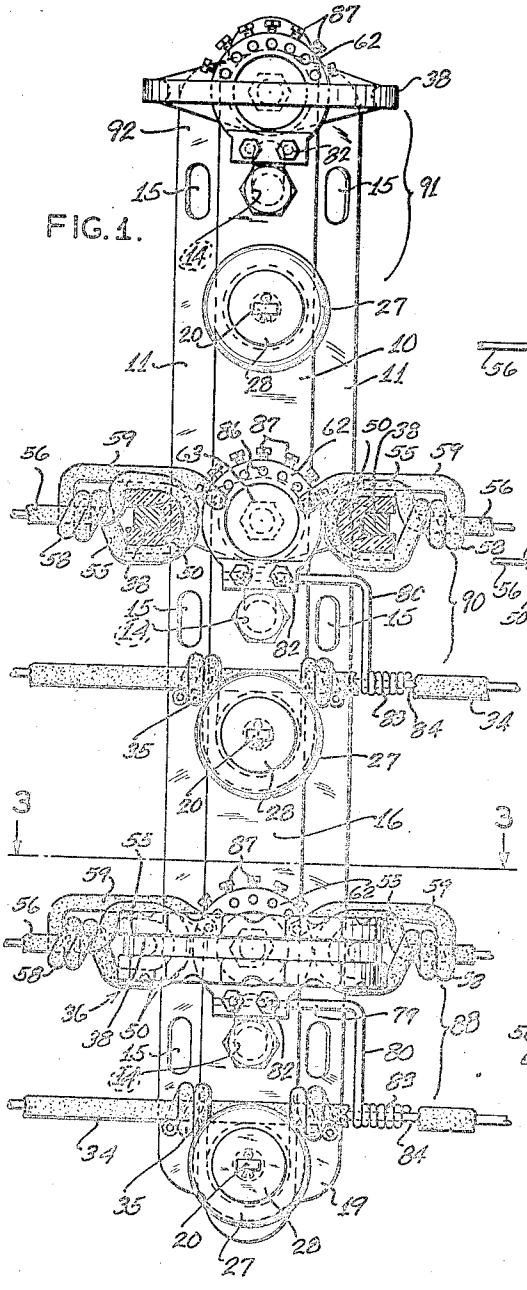


FIG. 1.

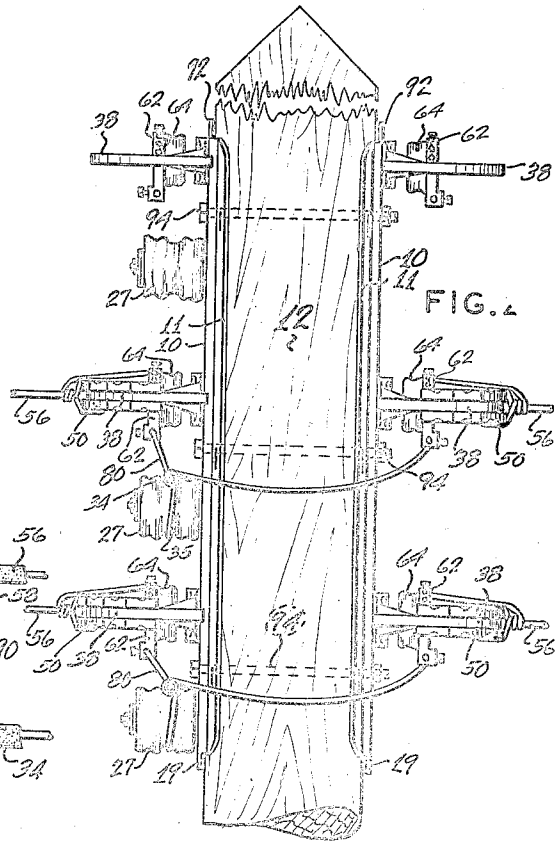


FIG. 2

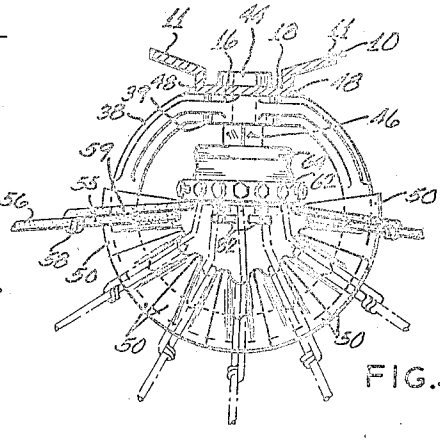


FIG. 3.

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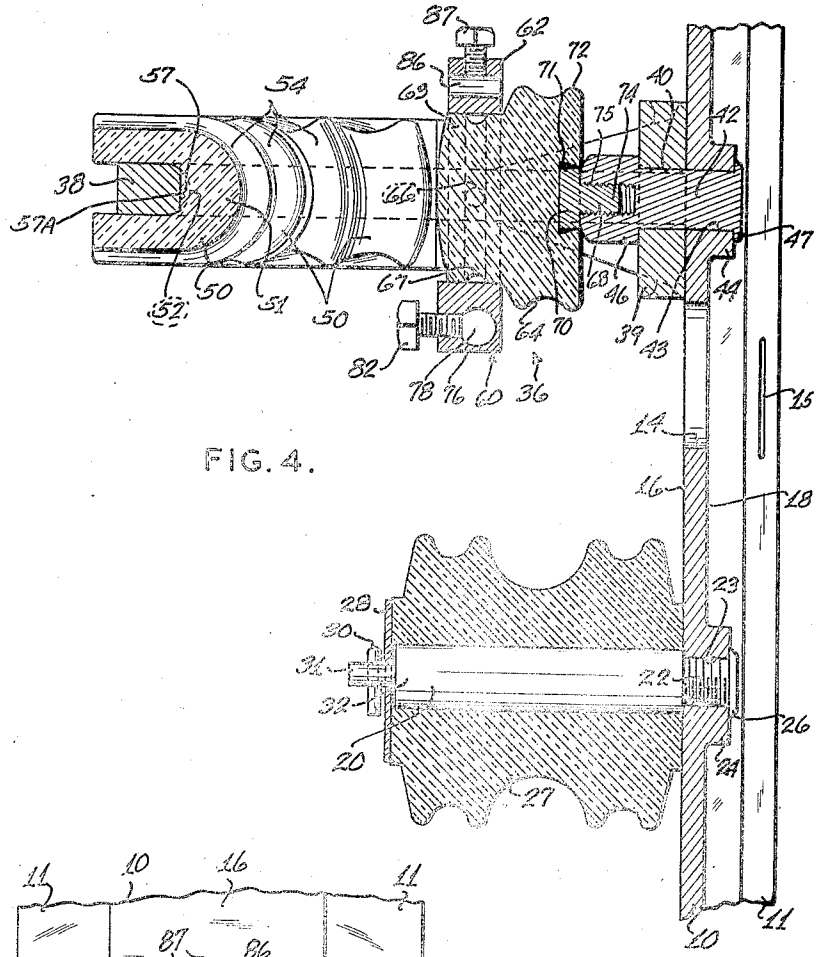


FIG. 4.

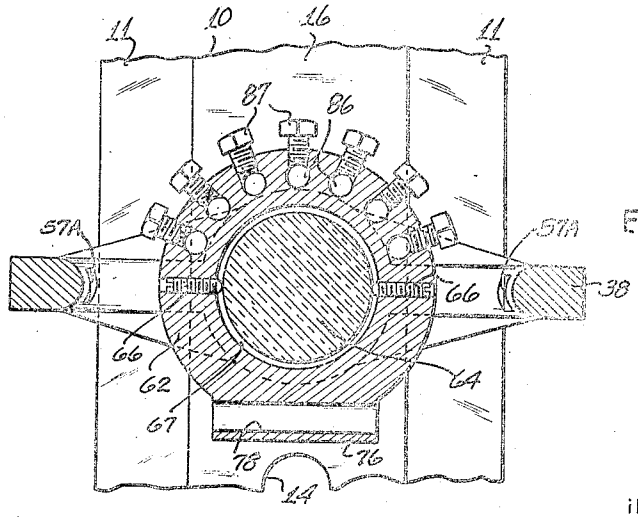


FIG. 5.

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SERVICE CONNECTOR AND DISTRIBUTOR UNIT

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Application January 19, 1940, Serial No. 314,602

8 Claims. (Cl. 174—149)

This invention relates to service connector and distributor units, such as electric service-line junction apparatus for electric power distribution systems and the like, and has particular reference to a junction device of improved form and construction, providing for the support of service lines or so-called service drops, and main power or power-feeder lines, and further, providing for effective and efficient electrical connection of the service lines to the power-feeder lines.

Although the improvements are herein described by making a somewhat specific reference to a combination electric secondary line rack and service distributor applicable particularly to the distribution of electric current for light and power, the arrangement is equally applicable to the distribution of energy in telephone and telegraph systems and communication work generally, as well as in any electrical system utilizing distribution conductors in substantial number.

Accordingly, a principal object of the invention is to provide a device of the character indicated, adapted for mounting upon a power line pole or like support, and which embodies improved provisions for securely anchoring corresponding ends of a number of service lines in relative adjacence, and for electrically connecting the service lines to a power-feeder line, such as a secondary, the latter provision including a terminal member separate from but electrically connected to the power-feeder, and to which one or more of the service lines may be connected in a manner readily permitting selective disconnection of the lines therefrom without disturbing or otherwise affecting the lines retained in circuit connection with the terminal.

Another important object attained by the present invention, is found in the provision of a junction device for the purpose indicated, which provides separate means for anchoring and physically supporting the power-feeder lines and service lines in a manner to isolate the lines of each group from stresses and strains of the lines of the other group, the arrangement of the securing means being such as to effect a grouping of certain of the service lines near one power feeder, and a similar grouping of other service lines near another power-feeder; the device further incorporating interconnecting or accumulating terminal means through which one or any plurality of the service lines in one group thereof may be electrically connected to the power-feeder associated with such service line group.

A further important object resides in the provision of a junction device of the character indicated, which facilitates rapid installation and securement of service drops, and electrical connection thereof to power-feeder lines, all with a minimum expenditure of effort and at reduced construction and labor costs.

Among other objects attained by the present invention may be noted the provision of a sturdy, compact and effective junction device for the purpose described, which provides for positive and easily effected connection of the service lines to, or disconnection thereof, from the power-feeder lines; the substantial elimination of high resistance connections, of the type generally resulting from sloppy and inefficient forms of wire joints, by the use of positive connectors which preclude sparking or arcing at the zones of electrical connection, and hence reduces this source of radio interference, and the provision for ready connection or disconnection of service lines selectively, without affecting the electrical service connection of other adjacent service lines.

Many other objects and advantages will appear readily, from the following description of a preferred embodiment of the invention, when read in connection with the accompanying drawings, in which:

Fig. 1 is a view in plan, of an assembled service connector and distributor, or junction device, forming the subject of the present invention, certain parts thereof being shown in section to illustrate constructional details thereof; Fig. 2 illustrates a pair of the companion junction devices as mounted on a supporting pole, one of the assemblies being shown as relieved of feeder-supporting insulators, and supplied by jumpers from the feeders carried by the companion assembly; Fig. 3 is a transverse sectional elevation of the device, as viewed from line 3—3 in Fig. 1; Fig. 4 is an enlarged, fragmentary longitudinal section of the device, illustrating assembly features of certain of the elements thereof, and Fig. 5 is an enlarged, fragmentary elevation of the device, shown partly in section to illustrate details of a terminal connector element thereof.

Referring now to the drawings by suitable characters of reference, the presently improved junction device includes a relatively long and narrow base member **10** providing a common frame or support for service line and power-feeder line supporting elements and electrical connector means for the lines, as will hereinafter appear more fully. The base member is by preference, of metal of a channel section (Fig. 3), and is provided with opposite, outwardly projecting, longitudinal flanges **11** on the channel side thereof. The flanges may be angularly related to the base in the manner shown in Fig. 3, to provide for firm seating of the base upon the curved surface of a supporting pole or the like, as the pole **12** shown in Fig. 2. The base structure may be a unitary member, formed by casting, or from suitably strong and durable metallic sheet stock, and given the desired shape as by punching and pressing operations. The

base may be provided with spaced apertures or slots 14, and the flanges with similarly spaced slots 15, for accommodating suitable bolts or screws by which the base may be securely mounted to a pole.

Turning now to the line supporting and line-connecting apparatus which incorporate the improvements constituting the present invention, these are mounted upon the flat or planar surface 16 of the base, opposite to the channel side 18 thereof. Accordingly, near one end 19 of the base which may be considered as the lower end in mounting the device to its supporting pole, is secured a stud 20, the manner of securement thereof being effected in the present example, by threading the stud end 22 through a tapped aperture 23 (Fig. 4) in the base end 19. The base may be strengthened on its channel side 18, at the zone of stud connection thereo, by a boss 24, while the stud may be effectively retained on the base as by turning or peening-over the end 22 against the boss 24, as at 26 (Fig. 4). Sleeved over and supported by the stud, is a spool-type insulator 27, the insulator being removably retained thereon as by a plate or washer 28 which is held in place by a pin or cotter element 30 seated in a lug 31 projecting from the free end 32 of the stud (Fig. 4). The spool insulator provides a support for a power-feeder line or conductor 34 (Fig. 1), which may be retained thereon in any well-known manner, as by the tie-wire 35, or other element.

Located adjacently to, but inwardly of the base end 19 and the insulator 27 thereon, is a service line support and connector structure 36. The structure includes a substantially annular or ring-like member 38 (Fig. 3), providing a rack or bracket for the support of the service lines, as will hereinafter appear. The bracket 38 in its preferred form, is formed to provide a laterally widened, flat base portion 39 adapted for seating upon the surface 16 of the base member 10 (Fig. 4). The bracket base is apertured as at 40, to receive a headed stud 42 which engages an aperture 43 extending through the base 10 and a strengthening boss 44 on the channel side 18 of the base. In assembly, the stud head 46 engages the bracket base 39 and thereby serves to clamp the bracket upon the supporting base 10, while the stud may be effectively retained in engagement with base 10 as by a nut, or merely by turning or peening-over the end 47 thereof, against the boss 44. The bracket in assembly, is arranged so that its ring portion lies in a plane extending transversely of the base 10, and preferably horizontally as appears in Fig. 1. Such position of the bracket may be assured at all times, by a lug 48 (Fig. 3) projecting from the bracket base 39 and engaging one side of the projecting channel part of base 10. Altho shown as substantially annular in plan, the ring 38 may, if desired, be of oval, rectangular or other regular or irregular plan, but is preferably of open construction to facilitate securement of the service wires, as will better hereinafter appear. Accordingly, the term "ring" is not to be construed herein as definitive of a true annulus.

Removably mounted upon the strain ring or bracket 38, are a plurality of insulator elements or blocks 50, each of U-shape by preference, and engaging the bracket in a manner such that the bridge portion 51 thereof, seats against the inner surface 52 of the bracket (Fig. 4). Further, the insulators are of wedge-shape as appears in Fig. 3, to adapt them for compact grouping in relative adjacence and preferably in lateral contact, one with another, the individual blocks 50 being thus located radially or fan-wise over the bracket or strain ring, outwardly from the bracket base. Each insulator 50 is preferably grooved on its surface, as shown at 54, to provide a retaining seat for a service line conductor to be supported thereby. It has been found advantageous in practice to provide the strain ring or bracket 38, and the individual service insulators 50 with interfitting portions tending to position the insulator on the ring, particularly so as to prevent displacement of the insulator. Such a provision in the example shown, includes a projection 57 on the inner face of the insulator bridge, which engages a corresponding recess 57A, formed on the inside periphery of the ring 38. As appears in Figs. 1 and 3, an end portion 55 of a service line or service drop 56, is wrapped around the insulator, in the groove 54 thereof, and secured as by twisting at 58, leaving a terminal portion 59 of the service line end 55 free for electrical connection to the power line 34, through a connector device later to be described. In the present example, there are seven of the individual insulators 50 on each strain ring, which provide for the support and anchoring of seven service drops to the member 38, the arrangement being such that the service line ends so secured, are grouped in relative adjacence, in a manner such that the lines may extend outwardly or divergently, i. e., fan-wise from the bracket (Fig. 3).

The structure 36 includes also, a service line terminal connector or accumulator block, indicated generally at 60 (Figs. 3, 4 and 5), located preferably within the circular area defined by the strain ring and adjacent the bracket base. The connector is comprised of an annulus or ring element 62, preferably of a rectangular or substantially square section, and formed from suitable conducting metal, as copper, brass, or any other suitable metal or alloy. The connector block, in assembly, is sleeved over one end portion 63 of an insulator element 64, and is removably secured thereupon in any suitable manner, as by set-screws 66 threadedly engaging the ring 62 and seating in an annular groove 67 formed in the surface of the insulator section 63 (Fig. 5). It will appear that the screws 66 and groove 67 enable, as may sometimes be desirable, an angular setting of the ring 62 in some other adjusted position than as shown, on the insulator 64. This feature is of particular value when the elements 62 and 64 with appurtenances may be used separately from the base or frame 10 as sometimes desired. The insulator 64 is carried by the strain bracket mounting stud 42, on the head end 46 thereof (Fig. 4), as by an element 68 having a head 70 and secured as by cementing, in a recess 71 in the insulator, axially of the end 72 thereof, and a threaded shank 74 adapted for seating in a threaded aperture 75 in the stud head 46. Thus the connector and insulator unit is mounted on the stud in a manner permitting ready removal thereof.

The terminal or connector ring 62 is provided on one side, with a projection or boss 76 (Figs. 4 and 5) of appreciable length, tangentially of the ring, the boss having a through-bore or passage 78 longitudinally thereof, for the reception of one end portion 79 of a short conductor 80 (Fig. 1). The conductor end 79 is retained in the bore and in positive electrical contact with the ring-boss 76, by one or more set screws 82,

two thereof being shown in the present example. The opposite end portion 83 of the short conductor 80, is electrically connected to the power-feeder line 34 heretofore referred to, as to a bared portion 84 thereof adjacent the zone of support of the feeder line upon the spool insulator 27 (Fig. 1). Such connection may be effected substantially as indicated in the figure above referred to, or in any other suitable or well-known manner. Also, it will be observed that by preference and in order to effect a short and direct connection of the connector ring to the power-feeder line, the final assembly position of the connector on the junction device, is such that the conductor-receiving boss 76 thereof, is disposed on the side nearest the feeder line supporting insulator 27.

Arranged along the side of the connector ring 62 opposite to the side thereof having the boss 76 formed thereon, are a plurality of service line terminal-receiving apertures 86 extending transversely through the ring. A set-screw 87 is associated with each of the apertures 86, for effecting a positive securement of a wire-terminal therein, in good electrical contact with the connector ring. In assembly of the service line distribution system to the junction device, as heretofore described in connection with the support of the service lines by the bracket-insulator assembly 38—50, the bared terminal end 59 of each service line 56, is inserted in one of the connector apertures 86 and secured therein by the set-screw 87 associated with the aperture. Since in the present example, the bracket-insulator assembly 38—50 is adapted for the support of seven service drops 56, the connector ring 62 may be provided with a corresponding number of the terminal-receiving apertures 86, one for each service line.

From the foregoing, it will be observed that all of the service lines supported by the bracket 38, are electrically connected to the power-feeder line 34, through the short conductor 80 and the terminal connector ring 62 common to the service lines. Moreover, it will appear now, that any one or more of the service lines may be readily disconnected from or re-connected to the terminal ring 62 without disturbing or adversely affecting the connection thereto, of any remaining service lines.

For the purpose of simplifying further description of the junction device, the hereinabove described power-feeder insulator assembly 27 and the service line support and connector structure 36, as located in the zone of the lower end 19 of the base 10, may be referred to as the junction unit 88.

Accordingly and as appears in the present example, the junction device includes additional junction units 90 and 91, each substantially identical in form and structure, to the described unit 88. The unit 90 is located substantially midway of the ends of base 10, while the unit 91 is located near the upper end 92 of the base. It is to be noted in this connection, that the elements 27 and 36 of each of the units 90 and 91, bear the same relative assembly location as that described for the corresponding elements of the lower unit 88. Thus there is effected a uniform arrangement of the parts making up the junction device, the arrangement being such as to greatly facilitate installation of the power-feeder and service lines to the junction units. As will be observed in Figs. 1 and 2, the power supply and distribution conductors are shown as applied only to the lower units 88 and 90, leaving the upper unit 91 free of these elements in order to better illustrate the assembly relation of the parts of the unit. It may further be noted that although the three assembly units 88, 90 and 91 are illustrated as uniform in construction, certain economies may be effected, say in the intermediate unit of a so-called grounded neutral system. In such a system, and in keeping with the practice of some utilities, the intermediate unit may utilize the same or a slightly modified collector element 60, secured for example to one of the through-bolts 94, obviating the use of one of the insulators 63.

The provision of a device of the character described, having at least three junction units, as the units 88, 90 and 91, fully adapts the device to power distribution systems of single-phase, two or three wire types, or to systems of three-phase type, as will be readily appreciated. Moreover and as shown in Fig. 2, at least two of the junction devices may be mounted upon a common supporting pole 12, and secured thereto as by the through-bolts 94 common to the devices, to provide accommodations for a large number of service drops from a single pole. While the presently illustrated junction device provides junction units each adapted to accommodate but seven service connections, obviously the service line capacity of each unit may be increased, as by employing a larger diameter bracket ring and a connector ring 62 having more than seven service line terminal-receiving apertures.

The companion, back-to-back arrangement of two of the racks, as shown by Fig. 2, will be that usually prevailing where the service requirements call for a pair of the assemblies. Since the feeders or supply lines 34 on one side of the pole will usually serve, through short connectors or jumpers, to supply the service drops on the companion rack, the latter is shown without the three feeder-carrying insulators 27. It is to be understood, however, that conditions occasionally exist which may require a separate set of feeders, one set on each rack, in which case the paired rack assemblies are or may be identical, each provided with its full complement of the several items of equipment.

As will appear in Fig. 2 which illustrates the junction device in its proper, intended position on the pole 12, each of the power-feeder lines 34 engages and rests upon the upper surface of its supporting insulator 27, thereby facilitating its retention thereon by the tie-wire element 35. Also, it will be observed that each service line supporting bracket assembly projects horizontally, outwardly from the pole, so that the service lines may be secured thereto, and electrically connected to the terminal ring, in an unhampered and greatly facilitated manner. Further, the presently improved junction device provides for the separate support of the power-feeder and service lines, thus obviating the disadvantages obtaining in prior types of service line junction to power feeders, wherein the service drops are supported by and connected directly to the feeder line, or are supported in common with the feeder line, from a single insulator member.

Although the improvements characterizing the invention have been described by reference to their more complete preferred combination, it is of course obvious that certain of the subcombinations illustrated are susceptible of separate utilization. For example, the terminal or accumulator 62, or the strain ring 38 may be utilized with considerable advantage separately, or may be employed together as a separate unit for suit-

able mounting apart from the base 10, as may many others of the separate features without necessarily combining them in the manner illustrated and described.

The presently improved service and feeder line junction device fully attains the objects enumerated hereinabove, and presents a device which is compact, of pleasing appearance and fully effective in its intended purpose. It is to be understood, however, that although the present description and drawings relate to a preferred embodiment of the invention, certain alterations in or modifications of the parts and their assembly relation, may be made without departing from the spirit and full intended scope of the invention, as defined by the appended claims.

I claim:

1. In a service connector unit for mounting on a pole or the like, to carry a group of service leads, a strain ring arranged as a tie anchorage for a plurality of the service leads, and sectional insulating blocks detachably carried in self-supporting relation by the strain ring and provided with an individual wire seat for each service lead, the wire seats being arranged to confine the service connections and anchorages relatively closely and to maintain the individual service leads out of overlying relation, the insulating blocks being provided with lateral recesses, enabling their application to the strain ring in embracing relation thereto, and the wire seats being so located that a conductor wrapped on one of the individual blocks, serves to keep the block in insulating, assembled relation to the ring.

2. In a unit for use on a pole or like support, for carrying a plurality of service conductors, a strain ring assembly adapted as a tying anchorage for the service conductors, the strain ring assembly including a metal annulus, a plurality of insulators, one for each service conductor, each said insulator being externally grooved, and being of substantially U-shape in section in the plane of the conductor so as detachably to straddle the metal annulus.

3. In a device of the character described, for use in an electric distribution system which includes a plurality of service conductors, an arcuate bracket adapted for the support of corresponding end portions of the service conductors, an element removably securing said bracket to a frame or like support, a plurality of individual insulators for the service conductors detachably carried by the bracket, each individual insulator being of U shaped section with its legs engaging opposite faces of the bracket, each insulator being provided with a groove for a service conductor tie loop, and so arranged on the bracket that tension on the loop serves to secure the insulator on the bracket.

4. In a service rack assembly for use in an electric distribution system including a plurality of service conductors and a power supply conductor, a horizontal bracket member for the support of the service conductors, a plurality of U shaped insulator elements on the bracket individual to the service conductors, the legs of the U shaped elements engaging opposite upper and lower faces of the bracket member, and the bridge portion of each insulator element being grooved in a vertical plane, whereby a tie loop of the adjacent conductor operates, under tension of the conductor, to secure the insulator element on the bracket, an element removably securing the bracket member to a rack frame or the like, the bracket having a widened seat portion for a terminal connector assembly, the seat portion being apertured to receive said securing element.

5. In a service distribution device of the character described, for use in an electric system including a supply conductor and a pluraliy of service conductors, a ring-like bracket provided with a base portion adapted for secured engagement with a frame, pole or like support, said bracket providing a common strain anchorage and support for corresponding terminal portions of said service conductors, the bracket being of an angular section over its anchorage portion, and a plurality of insulator elements each provided with a recessed seat conforming to the section of the anchorage portion of the bracket whereby to prevent turning of the insulator on the bracket, each of the seats being of a depth to enable the insulator to receive and embrace the adjacent bracket portion with the insulator in self-supporting relation thereto.

6. In a service distribution device of the character described, for use in an electric system including a supply conductor and a plurality of service conductors, a frame, a ring-like bracket projecting from said frame and being provided with a widened, apertured base portion adapted for mounting engagement with the frame, said bracket providing a common tie-anchorage for corresponding terminal portions of said service conductors, insulator elements individual to said conductor terminal portions, arranged in adjacence to each other on said bracket in a manner to insulate the conductors from the bracket, the bracket being formed of a stock of rectangular section, and the insulator elements each being provided with a rectangular, open end recess enabling the insulators to be applied over the bracket ring in detachable, non-rotative relation; the insulators being of tapered width and formed to lie in close adjacence on the bracket, and a mounting pin extending through the apertured base portion of the bracket, and adapted as a holder for a terminal connector within the bracket.

7. In a service connector unit for use on a pole or the like, a rigid tie element for a plurality of service conductors, the tie element being closed upon itself to provide an open interior, and lying substantially in a plane, a plurality of insulating blocks each formed to straddle one side of the tie element, and form a seat for a conductor tie loop, each insulator being so formed and positioned on the element, that tension on the adjacent service conductor serves to secure the insulator to the tie element, and a mounting stud for the tie element arranged so that one of its ends lies substantially within the tie element for support of a terminal connector near the plane of the tie element.

8. In a unit for use on a pole or like support for carrying a plurality of service conductors, a strain bracket assembly adapted as a tying anchorage for the service conductors, the bracket assembly including a rigid metal bracket element, a plurality of insulators, one for each service conductor, each said insulator being externally grooved, and being of substantially U-shape in section in the plane of the conductor so as detachably to straddle the metal bracket, the external sectional conformity of the bracket and the internal sectional conformity of each of the insulators, substantially corresponding in shape, and being of an angular outline to prevent twisting of the insulator on the bracket.

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